

DRIVE BEARING ARRANGEMENT OF  
ROTATING TOOLS IN PRINTING MACHINES

Background of the Invention

5           The present invention relates to a drive bearing arrangement of rotating tools in printing machines, particularly label printing machines. Specifically, the arrangement of rotating tools at the drive shafts of such machines, for example, the drive shaft of a servomotor.

10           It has been found to be advantageous in printing machines---particularly label printing machines---to allocate separate drives by means of a servo motor to the separate units of a printing machine such as the printing  
15           cylinder, embossing cylinder, or punching cylinder. This replaces the central drive and gear wheels (or chains or toothed belts).

20           Such a set-up is beneficial in that the individual components of each printing unit can be exchanged relatively quickly and easily. This allows the machine to be used in a more optimal fashion.

25           With regard to label printing machines, the highest demands are made on the precise position of each tool. Moreover, the simple and fast exchanging potential poses high demands on the interface of the change functions, namely the drive bearing arrangement between one end of the tools and the drive shaft of the stationary mounted  
30           servomotor.

Summary of the Invention

35           The object of the present invention is to provide a drive bearing arrangement between a rotating tool and a drive shaft which, in consideration of a tool changes,

can be disconnected relatively quickly and improve the precision of the bearing in comparison with conventional solutions.

5           This object is solved by providing a drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing includes an element located at an interface between the tool and the drive shaft on a tool axis. The element has an  
10 axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent  
15 rotation.

Due to the design of the drive bearing arrangement in accordance with the present invention, a geometrically optimal coupling between the tool and the drive for the  
20 rotating printing tools are provided that can be disconnected quickly and easily.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat  
25 more in detail.

#### Brief Description of the Drawings

Fig. 1 schematically illustrates a printing machine with a plurality of printing units and additional parts;  
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Fig. 2 illustrates a drive bearing of the printing machine shown in Fig. 1 in accordance with the invention; and

35           Fig. 3 an embodiment of a coupling cone of the

printing machine shown in Fig. 1.

Detailed Description of the Invention

5           Fig. 1 illustrates a modern printing machine of  
which the parts and printing units are electronically  
controlled through respective servomotors. The printing  
machine includes a web reeling off unit 1, a conditioning  
unit 2, which may include a screen printing device 3, a  
10   printing device 4, a plurality of further printing units  
5 - 9, a flex printing device 10 with a drying device 11,  
a supply part 12, a processing part 13 with punching  
device 14, reeling unit 15 and cutting unit 16, as well  
as a reeling unit 7 as storage part. The individual  
15   units are activated depending on the task at hand.

The rotating tools can be quickly exchanged in order  
to be available for new tasks.

20           Fig. 2 illustrates how a rotating tool 18 is  
releasably but firmly coupled via an element 19 having an  
axial projecting connecting cone 20 to the drive shaft 21  
of a servomotor 22 (illustrated schematically). The  
other end of the tool 18 is held in a known manner in a  
25   bearing, e.g., a needle bearing located in a detachable  
flange of a frame (not shown). Motor 22 is also mounted  
to a flange 23 of the base frame of the unit.

30           The servomotor 22 serves as drive for one of a  
variety of cylinders or other devices in the printing  
machine. For example, servomotor 22 can drive a form  
cylinder, a counter pressure cylinder, a coloring  
apparatus, or any additional similar device.

35           The tools (form cylinder, counter pressure cylinder,

coloring apparatus) first extend or pivot away from the frame flanges (not illustrated). Each tool is provided with connecting cone 20 and is inserted into cone shaped recesses 24 of drive shafts 21 and precisely centered therein. In order to have the tool sitting with the correct angular position on drive shaft 21, a pin 25 is employed to anchor the coupling cone 20. The pin 25 also safeguards against unwanted rotation with respect to recess 24. The coupling occurs by frictional engagement between the surfaces of cone 20 and cone shaped recess 24 in that coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (for example, by a tightening through a threaded drive).

Tightening rod 26 (26') (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing, it is only necessary to release the tightening rod 26 (with spreading head 28).

In order to quickly release the cone coupling, a pressurized medium such as air is passed through channels 29.

Fig. 3 of the drawing illustrates a variant of element 19' with coupling cone 20' and undercut, central bore 27'. This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).